

Computerized Medical Imaging and Graphics

VOLUME 19, 1995
LIST OF CONTENTS AND AUTHOR INDEX



Pergamon

Computerized Medical Imaging and Graphics

The International Journal of Radiological Diagnosis Using:
CT • NMR • PET • Digital Fluoroscopy • Computer Imaging

Editor-in-Chief: ROBERT S. LEDLEY

Departments of Physiology & Biophysics and Radiology, Georgetown University Medical Center, Washington, DC 20007, USA

Co-Editor-in-Chief: WILLIAM R. AYERS

Georgetown University Medical School, Washington, DC 20007, USA

Managing Editor: BLAIRE V. MOSSMAN

P.O. Box 13177, Scottsdale, AZ 85267-3177, USA

Editorial Board

- | | | | |
|--|--|---|---|
| Margaret Abernathy
Georgetown University Medical Ctr.
Washington, DC | Alden W. Dudley, Jr
Veterans Administration
Medical Ctr., Houston, TX | William A. Lindgren, Sr.
Linscan Systems, Inc.
Rolla, MO | Francis J. Scholz
Lahey Clinic Med. Ctr.
Burlington, MA |
| Raj S. Acharya
State Univ. of New York
Buffalo, NY | Noboru Funakubo
Tokyo Metropolitan Inst. of
Technology
Tokyo, Japan | Herbert Lubs
University of Miami
Miami, FL | Steven E. Seltzer
Harvard University
Medical School
Boston, MA |
| Gordon Banks
University of Pittsburgh
Pittsburgh, PA | Arthur P. Ginsburg
Vision Sciences Research Corp.
San Ramon, CA | Barry R. Masters
Uniformed Services
University of the Health Sciences
Bethesda, MD | Max Shaff
Vanderbilt University
Nashville, TN |
| P.E. Billimoria
Loma Linda Univ. Medical Ctr.
Loma Linda, CA | Edmund Glaser
Univ. of Maryland Sch. of Med.
Baltimore, MD | Donald McEachron
Drexel University
Philadelphia, PA | Lawrence Stark
University of California
Berkeley, CA |
| P. Boesiger
Institut für Biomedizinische Technik
Zurich, Switzerland | David Goodenough
George Washington University
Washington, DC | D. Meyer-Ebrecht
Aachen University of Technology
Aachen, Germany | Alasdair C. Steven
National Institutes of Health
Bethesda, MD |
| Fred L. Bookstein
300 NIB1035
Ann Arbor, MI | Randall A. Hawkins
San Francisco, CA | K. Jack Momose
Massachusetts General Hospital
Boston, MA | William V. Stoecker
University of Missouri
Rolla, MO |
| Gerhard Brauer
University of Victoria
Victoria, BC, Canada | Robert J. Herfkens
Stanford University Sch. of Med.
Stanford, CA | Randy H. Moss
University of Missouri
Rolla, MO | Jung Ho Suh
Ajon University
Medical Center
Suyon, Korea |
| Michael Buas
Georgetown University Medical Ctr.
Washington, DC | Gabor T. Herman
University of Pennsylvania
Philadelphia, PA | Bjorn Nordenstrom
Karolinska Hospital
Stockholm, Sweden | Mutsumasa Takahashi
Kumamoto University
School of Medicine
Kumamoto, Japan |
| Art Burgess
Rochester Institute of Technology
Rochester, NY | H.K. Huang
University of California
San Francisco, CA | Louis S. Parvey
Diagnostic Imaging
Memphis, TN | Oleh Tretiak
Drexel University
Philadelphia, PA |
| Ralph Chapman
Museum of Natural History
Washington, DC | Ira Kalet
University of Washington
Seattle, WA | Benham Pourdeyhimi
University of Maryland
College Park, MD | Homer L. Twigg, Jr.
Georgetown University Hospital
Washington, DC |
| Shirley Cheng
Access Anywhere Communications,
Inc.
St. Louis, MO | Bruce Kall
Mayo Foundation
Rochester, MN | D.P. Pretschner
Univ. Hildesheim
Hildesheim, Germany | Jayaram Udupa
University of Pennsylvania
Philadelphia, PA |
| Z.H. Cho
University of California
Irvine, CA | Jorge Kattah
Georgetown University Hospital
Washington, DC | T. Pun
University of Geneva
Geneva, Switzerland | Michael W. Vannier
Mallinckrodt Inst. of Radiology
St. Louis, MO |
| Mary G. Cormier
Georgetown University
Washington, DC | Claus O. Koehler
Dept. for Medical and Biological
Informatics
Heidelberg, Germany | Ian L. Pykett
Intermagnetics General
Corporation
Latham, NY | A. Wackenheim
Université de Strasbourg
Strasbourg, France |
| Arnold Cowen
The General Infirmary
Leeds, UK | N.A. Lassen
Bispebjerg Hospital
Copenhagen, Denmark | William D. Richard
Washington University
St. Louis, MO | Steven Warsof
Tidewater Prenatal Center
Virginia Beach, VA |
| Charles A. Csuri
Ohio State University
Columbus, OH | Gary S. Ledley
Albert Einstein
Medical Center
Philadelphia, PA | Richard A. Robb
Mayo Clinic
Rochester, MN | Leon A. Weisberg
Tulane University
School of Medicine
New Orleans, LA |
| Richard Cumberlin
Georgetown University Hospital
Washington, DC | K. Francis Lee
University of Miami
Miami, FL | Denis Rutovitz
Western General Hospital
Edinburgh, UK | Darrell E. Wolfley
Yale Eye Center
New Haven, CT |
| Ian Dryden
University of Leeds, UK | George C. Levy
Syracuse University
Syracuse, NY | | |

Editorial Office: Computerized Medical Imaging and Graphics, National Biomedical Research Foundation, Georgetown University Medical Center, 3900 Reservoir Road, NW, Washington, DC 20007, USA. E-mail: Robert S. Ledley: ledley@nbf.georgetown.edu; Blaire V. Mossman: atbvm@asuacad (Bitnet) and atbvm@asvm.inre.asu.edu (Internet)

Production Office: Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, UK. Production Editor: Steve Raywood; E-mail: s.raywood@elsevier.co.uk

Publishing, Subscription, and Advertising Offices: Elsevier Science Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, USA and Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, UK.

Published Bimonthly. Annual Institutional Subscription Rates 1996: North, Central, and South America, U.S. \$819.00, Rest of World £515.00. Professional subscription rates 1996, which must be prepaid by personal cheque or credit card: North, Central, and South America: U.S. \$125.00, Rest of World £78.00. Sterling prices exclude VAT. Non VAT registered customers in the European Community will be charged the appropriate VAT in addition to the price listed. Prices include postage and insurance and are subject to change without notice.

CONTENTS

SPECIAL ISSUE: CARDIOPULMONARY IMAGING

<i>Raj S. Acharya, Dmitry B. Goldgof, and Eric A. Hoffman</i>	1 Editorial
<i>Raj Acharya, Richard Wasserman, Jeffrey Stevens, and Carlos Hinojosa</i>	3 Biomedical Imaging Modalities: A Tutorial
<i>Hsiao-Kun Tu, Arthur Matheny, Dmitry B. Goldgof, and Horst Bunke</i>	27 Left Ventricular Boundary Detection From Spatio- Temporal Volumetric Computed Tomography Images
<i>Shriram Revankar, David Sher, Chris Cheung, Valerie L. Shalin, Maya Ramamurthy, and Steve Rosenthal</i>	47 Supervised Interpretation of Echocardiograms With a Psychological Model of Expert Supervision
<i>Raj Acharya</i>	61 Segmentation of Multidimensional Cardiac Images
<i>Tim McInerney and Demetri Terzopoulos</i>	69 A Dynamic Finite Element Surface Model for Segmentation and Tracking in Multidimensional Medical Images With Application to Cardiac 4D Image Analysis
<i>Chang Wen Chen, Jiebo Luo, Kevin J. Parker, and Thomas S. Huang</i>	85 CT Volumetric Data-Based Left Ventricle Motion Estimation: An Integrated Approach
<i>Eric A. Hoffman, Jehangir K. Tajik, and Steven D. Kugelmass</i>	101 Matching Pulmonary Structure and Perfusion Via Combined Dynamic Multislice CT and Thin-Slice High-Resolution CT
<i>Alexander M. Taratorin and Samuel Sideman</i>	113 3D Functional Mapping of Left Ventricular Dynamics
<i>Gopal Sundaramoorthy, John D. Hoford, Eric A. Hoffman, and William E. Higgins</i>	131 IMPROMPTU: A System For Automatic 3D Medical Image-Analysis
<i>Susan A. Wood, John D. Hoford, Eric A. Hoffman, Elias Zerhouni, and Wayne Mitzner</i>	145 A Method for Measurement of Cross Sectional Area, Segment Length, and Branching Angle of Airway Tree Structures In Situ
<i>Djaffer Ibaroudene</i>	153 Representation and Display of Three-Dimensional Medical Images Using a Linear Octree
<i>Ramalingam Sridhar and Terry Jones</i>	161 VLSI in Biomedical Imaging Systems
	I Software Survey Section

Volume 19 Number 2**1995****CONTENTS**

- | | | |
|--|-----|--|
| <i>Marit Holden, Eric Steen, and
Arvid Lundervold</i> | 171 | Segmentation and Visualization of Brain Lesions
in Multispectral Magnetic Resonance Images |
| <i>Michael Friedlinger, Lothar R. Schad,
Stefan Blüml, Bernhard Tritsch, and
Walter J. Lorenz</i> | 185 | Rapid Automatic Brain Volumetry on the Basis of
Multispectral 3D MR Imaging Data on Personal
Computers |
| <i>J. G. M. van den Broek, C. H. Slump,
C. J. Storm, A. C. van Benthem, and
B. Buis</i> | 207 | Three-Dimensional Densitometric Reconstruction
and Visualization of Stenosed Coronary Artery
Segments |
| <i>K. W. Sievers, E. Löhr, and
T. Bauermann</i> | 219 | MR Relaxometry: Estimating Overhydration in
Renal Failure |
| <i>Yoshiyuki Ishimitsu and H. K. Huang</i> | 227 | Light Photon Equalization and Its Application to
X-Ray Film Digitization |
| <i>Hisataka Kobayashi,
Yoshihiko Kotoura, Mariko Hosono,
Tadao Tsuboyama, Harumi Sakahara,
and Junji Konishi</i> | 237 | Solitary Muscular Involvement by Tuberculosis:
CT, MRI, and Scintigraphic Features |
| <i>Yasuyuki Yamashita, Mikihiro Harada,
Miyuki Torashima,
Mutsumasa Takahashi,
Hironori Tashiro, Mikio Matsui,
Kohji Miyazaki, and Hitoshi Okamura</i> | 241 | Unruptured Interstitial Pregnancy: A Pitfall of MR
Imaging |
| <i>Rafaela Soler, Francisco Pombo,
Esther Rodríguez, Angeles Cobas,
Carlos F. Lago, and Juan P. Torres</i> | 247 | MR Findings in Hereditary Spherocytosis |

I Software Survey Section**Volume 19 Number 3****1995****CONTENTS**

- | | | |
|--|-----|--|
| <i>Ewa Pietka</i> | 251 | Computer-Assisted Bone Age Assessment Based
on Features Automatically Extracted From a Hand
Radiograph |
| <i>Hajime Kato, Gen Kubota,
Kaoru Kojima, Naoto Hayashi,
Eitaro Nishihara, Hiroyuki Kura,
and Mitsuhiro Aizawa</i> | 261 | Preliminary Time-Flow Study: Comparison of
Interpretation Times Between PACS Workstations
and Films |
| <i>Jun-Feng Guo, Yuan-Long Cai,
and Yu-Ping Wang</i> | 267 | Morphology-Based Interpolation for 3D Medical
Image Reconstruction |

- Hideki Hirota, Kazuhiro Shimamoto, Kouji Yamakawa, Takeo Ishigaki, Yukio Takahashi, Naoki Sugiyama, Eitaro Nishihara, and Yuichiro Tani* 281 Clinical Evaluation of Newly Developed CRT Viewing Station: CT Reading and Observer's Performance
- Glenn M. Hammer, Matthew J. Kuhn, David M. Meis, and Linda C. Meis* 287 Quantitative Contrast Media Dose Evaluation for Cranial Computed Tomography
- Phoebe G. Spetsieris, James R. Moeller, Vijay Dhawan, Tatsuya Ishikawa, and David Eidelberg* 295 Visualizing the Evolution of Abnormal Metabolic Networks in the Brain Using PET
- Matthew J. Kuhn, Terry J. Burk, and Frank C. Powell* 307 Unilateral Cerebral Cortical and Basal Ganglia Enhancement Following Overdosage of Nonionic Contrast Media
- I Software Survey Section

Volume 19 Number 4

1995

CONTENTS

- A. Bartolini, B. Gasparetto, M. Furlan, F. Roncallo, L. Sullo, G. Trivelli and A. Primavera* 313 Functional Circulation Images by Angio-CT in the Assessment of Small Deep Cerebral Infarctions
- James M. Jimenez, Sean O. Casey, Marc Citron and Arfa Khan* 325 Calcified Pulmonary Metastases from Medullary Carcinoma of the Thyroid
- Geoffrey Dougherty* 329 Quantitative Indices for Ranking the Severity of Hepatocellular Carcinoma
- David A. Fisher, David J. Mond, Alexander Fuchs and Arfa Khan* 339 Mucoepidermoid Tumor of the Lung: CT Appearance
- Robert S. Shapiro, Roger Ramos, Agata Stancato-Pasik, Neville Glajchen, Rosaleen Parsons, Harold A. Mitty and H. C. Yeh* 343 Transjugular Intrahepatic Portosystemic Shunt: Correlation of Portal Vein Velocity Measurements and Portosystemic Pressure Gradients
- Yasuyuki Yamashita, Miyuki Torashima, Yoshimi Hatanaka, Mutsumasa Takahashi, Koreatsu Fukumatsu, Nobuyuki Tanaka, Kohji Miyazaki and Hitoshi Okamura* 351 MR Imaging of Atypical Polypoid Adenomyoma
- R. Nuri Sener* 357 Cysts of the Septum Pellucidum
- Elmo F. Masucci, Frederick T. Borts, Stanley M. Perl, Louis Wener, John Schwankhaus and John F. Kurtzke* 361 MR vs CT in Progressive Supranuclear Palsy
- S. L. Lou, Jun Wang, Michael Moskowitz, Todd Bazzill and H. K. Huang* 369 Methods of Automatically Acquiring Images from Digital Medical Systems

Volume 19 Number 5

1995

CONTENTS

- A. H. Voie and F. A. Spelman* 377 Three-dimensional Reconstruction of the Cochlea from Two-dimensional Images of Optical Sections
- L. A. Fox, M. W. Vannier, O. C. West, A. J. Wilson, G. A. Baran and T. K. Pilgram* 385 Diagnostic Performance of CT, MPR and 3DCT Imaging in Maxillofacial Trauma
- I. Holländer* 397 Cerebral Cartography—A Method for Visualizing Cortical Structures
- R. N. Sener* 417 Rubinstein-Taybi Syndrome: Cranial MR Imaging Findings
- H. Kobayashi, Y. Kotoura, M. Hosono, R. Fujimoto, T. Tsuboyama, H. Itoh and J. Konishi* 419 3D-Spiral CT of Multiple Exostoses
- R. N. Sener* 423 Isolated Choroid Plexus Lipomas
- K. P. Moresco and R. S. Shapiro* 427 Abdominal Aortic Coarctation: CT, MRI, and Angiographic Correlation
- R. Soler, F. Pombo, A. Bargiela, A. Gayol and E. Rodríguez* 431 MRI of Pseudocoarctation of the Aorta: Morphological and Cine-MRI Findings
- A. Izumihara, T. Orita, T. Tsurutani, K. Kajiwara, T. Matsunaga and M. Hatano* 435 Pineal and Suprasellar Metastasis of Lung Cancer: Case Report and Review of the Literature
- A. Khorsandi, K. Sterling, H. Mitty and R. S. Shapiro* 439 A 24 Year Follow Up of an Isolated Lymphangioma of the Kidney
- K. O. Bushara, G. Petermann, A. J. Waclawik, W. D. Brown and H. S. Schutta* 443 Sarcoidosis of the Spinal Cord with Extensive Vertebral Involvement: A Case Report
- N. S. Eshkar, R. S. Shapiro, M. Shafir and M. Sung* 447 Case Report: MRI of Extrapaneatic Gastrinoma

Volume 19 Number 6

1995

CONTENTS

- Johann Link, Stefan Mueller-Huelsbeck, Joachim Brossmann, Malte Grabener, Ulrich Stock and Martin Heller* 451 Prospective Assessment of Carotid Bifurcation Disease with Spiral CT Angiography in Surface Shaded Display (SSD)-Technique
- Mario Marini, Gregorio Lillo Odoardi and Piero Tartaglia* 457 Duplex-Doppler and Cine-Bmode Echography of the Temporal-mandibular Joint. Clinical Validation
- Ewa Pietka and H. K. Huang* 465 Epiphyseal Fusion Assessment Based on Wavelets Decomposition Analysis

*Jason M. Stoane,
Maurice R. Poplausky, Jack O. Haller
and Walter E. Berdon*

R. Nuri Sener

R. Nuri Sener

R. Nuri Sener

R. Nuri Sener

R. Nuri Sener

473 **Panner's Disease: X-ray, MR Imaging Findings and Review of the Literature**

477 **MR Imaging of Abnormally Rotated Medulla Oblongata, and a Criterion for Assessment of its Normal Orientation**

481 **MR Imaging of Joubert's Syndrome**

487 **Chiari I Malformation Associated with Callosal Dysgenesis and Ectopic Neurohypophysis**

491 **Cerebellar Agenesis versus Vanishing Cerebellum in Chiari II Malformation**

495 **Abnormal Venous Drainage in Periventricular Leukomalacia**

AUTHOR INDEX

- Acharya, R., 3, 61
Aizawa, M., 261
- Baran, G. A., 385
Bargiela, A., 431
Bartolini, A., 313
Bauermann, T., 219
Bazzill, T., 369
Berdon, W. E., 473
Blüml, S., 185
Borts, F. T., 361
Brossmann, J., 451
Brown, W. D., 443
Buis, B., 207
Bunke, H., 27
Burk, T. J., 307
Bushara, K. O., 443
- Cai, Y.-L., 267
Casey, S. O., 325
Chen, C. W., 85
Cheung, C., 47
Citron, M., 325
Cobas, A., 247
- Dhawan, V., 295
Dougherty, G., 329
- Eidelberg, D., 295
Eshkar, N. S., 447
- Fisher, D. A., 339
Fox, L. A., 385
Friedlinger, M., 185
Fuchs, A., 339
Fujimoto, R., 419
Fukumatsu, K., 351
Furlan, M., 313
- Gasparetto, B., 313
Gayol, A., 431
Glajchen, N., 343
Goldgof, D. B., 27
Grabener, M., 451
Guo, J.-F., 267
- Haller, J. O., 473
Hammer, G. M., 287
Harada, M., 241
Hatanaka, Y., 351
Hatano, M., 435
Hayashi, N., 261
Heller, M., 451
Higgins, W. E., 131
Hinojosa, C., 3
Hirota, H., 281
Hoffman, E. A., 101, 131, 145
Hoford, J. D., 131, 145
Holden, M., 171
Holländer, I., 397
Hosono, M., 237, 419
Huang, T. S., 85
Huang, H. K., 227, 369, 465
- Ibaroudene, D., 153
Ishigaki, T., 281
Ishikawa, T., 295
Ishimitsu, Y., 227
- Itoh, H., 419
Izumihara, A., 435
- Jimenez, J. M., 325
Jones, T., 161
- Kajiwarra, K., 435
Kato, H., 261
Khan, A., 325, 339
Khorsandi, A., 439
Kobayashi, H., 237, 419
Kojima, K., 261
Konishi, J., 237, 419
Kotoura, Y., 237, 419
Kubota, G., 261
Kugelmass, S. D., 101
Kuhn, M. J., 287, 307
Kura, H., 261
Kurtzke, J. F., 361
- Lago, C. F., 247
Link, J., 451
Löhr, E., 219
Lorenz, W. J., 185
Lou, S. L., 369
Lundervold, A., 171
Luo, J., 85
- Marini, M., 457
Masucci, E. F., 361
Matheny, A., 27
Matsui, M., 241
Matsunaga, T., 435
McInerney, T., 69
Meis, D. M., 287
Meis, L. C., 287
Mitty, H., 439
Mitty, H. A., 343
Mitzner, W., 145
Miyazaki, K., 241, 351
Moeller, J. R., 295
Mond, D. J., 339
Moresco, K. P., 427
Moskowitz, M., 369
Mueller-Huelsbeck, S., 451
- Nishihara, E., 261
Nishihara, E., 281
- Odoardi, G. L., 457
Okamura, H., 241, 351
Orita, T., 435
- Parker, K. J., 85
Parsons, R., 343
Perl, S. M., 361
Petermann, G., 443
Pietka, E., 251, 465
Pilgram, T. K., 385
Pombo, F., 247, 431
Poplausky, M. R., 473
Powell, F. C., 307
Primavera, A., 313
- Ramamurthy, M., 47
Ramos, R., 343
Revankar, S., 47
Rodríguez, E., 247, 431
- Roncallo, F., 313
Rosenthal, S., 47
- Sakahara, H., 237
Schad, L. R., 185
Schutta, H. S., 443
Schwankhaus, J., 361
Sener, R. N., 357, 417, 423, 481
Sener, R. N., 477, 487, 491, 495
Shafir, M., 447
Shalin, V. L., 47
Shapiro, R. S., 343, 427, 439, 447
Sher, D., 47
Shimamoto, K., 281
Sideman, S., 113
Sievers, K. W., 219
Slump, C. H., 207
Soler, R., 247, 431
Spelman, F. A., 377
Spetsieris, P. G., 295
Sridhar, R., 161
Stancato-Pasik, A., 343
Steen, E., 171
Sterling, K., 439
Stevens, J., 3
Stoane, J. M., 473
Stock, U., 451
Storm, C. J., 207
Sugiyama, N., 281
Sullo, L., 313
Sundaramoorthy, G., 131
Sung, M., 447
- Tajik, J. K., 101
Takahashi, M., 241, 351
Takahashi, Y., 281
Tanaka, N., 351
Tani, Y., 281
Taratorin, A. M., 113
Tartaglia, P., 457
Tashiro, H., 241
Terzopoulos, D., 69
Torashima, M., 241, 351
Torres, J. P., 247
Tritsch, B., 185
Trivelli, G., 313
Tsuboyama, T., 237, 419
Tsurutani, T., 435
Tu, H.-K., 27
- van den Broek, J. G. M., 207
van Benthem, A. C., 207
Vannier, M. W., 385
Voie, A. H., 377
- Waclawik, A. J., 443
Wang, J., 369
Wang, Y.-P., 267
Wasserman, R., 3
Wener, L., 361
West, O. C., 385
Wilson, A. J., 385
Wood, S. A., 145
- Yamakawa, K., 281
Yamashita, Y., 241, 351
Yeh, H. C., 343
- Zerhouni, E., 145